To: T10 Committee

From: Neil Wanamaker

Subject: SAT-4: Translation of LOG SENSE to page 0Dh (temperature)

Abstract: The currently-defined translation of the LOG SENSE to page 0Dh reads the Device Statistics log, which is not one of the logs required to be readable during SANITIZE. The ability to read this log page is required during SANITIZE per SBC-3, and is a time when obtaining temperature readings is critical. It is proposed to modify the translation of this command to allow obtaining the current temperature from the SCT Command/ Status log.

Revision history:

Revision 0: 3 December, 2014: Initial proposal

Revision 1: 9 March, 2015: Updated as a result of comments received during December, 2014 CAP meeting.

Revision 2: 15 September, 2015: Updated as a result of comments received during March, 2015 CAP meeting.

8.3 LOG SENSE command

8.3.1 LOG SENSE command overview

The LOG SENSE command provides a means for the application client to retrieve statistical or otheroperational information maintained by the SCSI target device about the SCSI target device or its logical units.
The SATL shall implement support for this field by returning the log page data for the particular page requested.

Table 14 shows the translation for fields specified in the LOG SENSE CDB.

Table 14 — LOG SENSE CDB field translations

Field	Description or reference
OPERATION CODE	Set to 4Dh.
SP	Unspecified (see 3.4.2)
PC	8.3.2
PAGE CODE	8.3.3
SUBPAGE CODE	Unspecified (see 3.4.2)
PARAMETER POINTER	Unspecified (see 3.4.2)
ALLOCATION LENGTH	Unspecified (see 3.4.2).
CONTROL	6.5

8.3.2 PC (page control) field

The SATL interpretation and support of the page control values is shown in table 15.

Table 15 — PC field

Code	SAT Translation
00b	Unspecified (see 3.4.2)
01b	Supported
10b	Unspecified (see 3.4.2)
11b	Unspecified (see 3.4.2)

8.3.3 PAGE CODE and SUB PAGE CODE fields

The SATL shall support these field as defined in SPC-4. The SATL emulation for support of the PAGE CODE field is provided in table 16.

Table 16 — PAGE CODE / SUB PAGE CODE fields

Page Code	Subpage Code	Description
00h	00h	Supported Log Pages log page: The SATL shall implement this page by returning a list of supported log pages (see 10.2.3).
0Dh	00h	Table 96.
10h	00h	Self-Test Results log page: The SATL shall determine if the ATA SMART self-test is supported from the ATA IDENTIFY DEVICE data log SMART SELF-TEST SUPPORTED bit . a) If the ATA SMART self-test is not supported (i.e., SMART SELF-TEST SUPPORTED bit is set to zero) then the SATL shall return a CHECK CONDITION status with the sense key set to ILLEGAL REQUEST and additional sense code set to INVALID FIELD IN CDB. b) If the ATA SMART self-test is supported (i.e., SMART SELF-TEST SUPPORTED bit is set to one) then the SATL shall return the translated Self-Test Results log page to the application client (see 10.2.5).
2Fh	00h	Informational Exceptions log page: The SATL shall determine if the ATA SMART feature set is supported from the ATA IDENTIFY DEVICE data log SMART bit. 1) If the ATA SMART feature set is not supported (i.e., SMART is set to zero) then the SATL shall return a CHECK CONDITION status with the sense key set to ILLEGAL REQUEST and additional sense code set to INVALID FIELD IN CDB. 2) If the ATA SMART feature set is supported (i.e., SMART is set to one) then the SATL shall determine if the ATA SMART feature set is enabled or disabled from the ATA IDENTIFY DEVICE data log SMART ENABLED bit. A) If the ATA SMART feature set is disabled (i.e., SMART ENABLED is set to zero) then the SATL shall return a CHECK CONDITION status with the sense key set to ABORTED COMMAND and additional sense code set to ATA DEVICE FEATURE NOT ENABLED. B) If the ATA SMART feature set is enabled (i.e., SMART ENABLED is set to one) then the SATL shall return the translated Informational Exceptions log page to the application client (see 10.2.6.1).
All others	All	Unspecified (see 3.4.2)

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10.2.8 Temperature log page

10.2.8.1 Temperature log page overview

The Temperature log page provides detail about the temperature reported by the device server. Table 127 shows the parameters that may be returned.

Table 94 — Temperature Log Page Parameters

Parameter	Reference
Temperature	10.2.8.2
Reference Temperature	10.2.8.3

Table 128 shows the log page header fields.

Table 95 — Temperature log page header fields

Field	Description or reference
DS	Unspecified (see 3.4.2)
SPF	Shall be set to zero
PAGE CODE	Shall be set to 0Dh
SUBPAGE CODE	Shall be set to zero
PAGE LENGTH	Unspecified (see 3.4.2)

10.2.8.2 Current Temperature log parameter

The fields of the Temperature log are set as described in Table 96.

~~The Current Temperature log parameter is unspecified (see 3.4.2) unless:~~

~~a) the ATA Current Temperature statistic is supported (i.e., bit 63 of the ATA QWord located at byte 8 of the Temperature Statistics page of the ATA Device Statistics log is set to one); and~~
~~b) the ATA Current Temperature statistic is valid (i.e., bit 62 of the ATA QWord located at byte 8 of the Temperature Statistics page of the ATA Device Statistics log is set to one).~~

~~If the ATA Current Temperature statistic is supported and valid, then the SATL shall return the Temperature log parameter as shown in table 129.~~

Table 96 — Temperature log parameter fields

Field	Description or reference
PARAMETER CODE	Shall be set to 0000h
DU	Shall be set to zero
TSD	Shall be set to zero
ETC	Unspecified (see 3.4.2)

Table 96 — Temperature log parameter fields

Field	Description or reference
TMC	Unspecified (see 3.4.2)
FORMAT AND LINKING	Shall be set to 11b
PARAMETER LENGTH	Shall be set to 02h
TEMPERATURE	1) If SANITIZE is in progress, and if SCT is supported (i.e., bit 0 of word 206 of IDENTIFY DEVICE data is set to one), the SATL shall obtain the HDA TEMP field of the SCT command/status log (see ACS-4). If bit 7 of this value is set to one, the TEMPERATURE field of the Temperature log page is set to FFh, otherwise, the TEMPERATURE field is set to the value of HDA_TEMP. 2) If SANITIZE is not in progress, and A) the ATA Current Temperature statistic is supported (i.e., bit 63 of the ATA QWord located at byte 8 of the Temperature Statistics page of the ATA Device Statistics log is set to one); and B) the ATA Current Temperature statistic is valid (i.e., bit 62 of the ATA QWord located at byte 8 of the Temperature Statistics page of the ATA Device Statistics log is set to one), then the TEMPERATURE field of the Temperature log is obtained by reading the ATA Current Temperature statistic from the Temperature Statistics page of the ATA device statistics log. If bit 7 of the ATA Current Temperature is set to one, the TEMPERATURE field is set to 00h. 3) Otherwise, the TEMPERATURE field is set to FFh. ~~a) if bit 7 of the ATA Current Temperature statistic is set to one, then the SATL shall set bits 7:0 of the TEMPERATURE field to 00h; and~~ ~~b) if bit 7 of the ATA Current Temperature statistic is set to zero, then the SATL shall set bits 7:0 of the TEMPERATURE field to bits 7:0 of the ATA Current Temperature statistic~~

10.2.8.3 Reference Temperature log parameter

The Reference Temperature log parameter is unspecified (see 3.4.2) unless:

c) the ATA Specified Maximum Operating Temperature statistic is supported (i.e., bit 63 of the ATA QWord located at byte 88 of the Temperature Statistics page of the ATA Device Statistics log is set to one); and
d) the ATA Specified Maximum Operating Temperature statistic is valid (i.e., bit 62 of the ATA QWord located at byte 88 of the Temperature Statistics page of the ATA Device Statistics log is set to one).

If the ATA Specified Maximum Operating Temperature statistic is supported and valid, then the SATL shall return the Reference Temperature log parameter as shown in table 130.

Table 97 — Reference Temperature log parameter fields

Field	Description or reference
PARAMETER CODE	Shall be set to 0001h
DU	Shall be set to zero
TSD	Shall be set to zero
ETC	Unspecified (see 3.4.2)
TMC	Unspecified (see 3.4.2)
FORMAT AND LINKING	Shall be set to 11b
PARAMETER LENGTH	Shall be set to 02h
REFERENCE TEMPERATURE	a) if bit 7 of the ATA Specified Maximum Operating Temperature statistic is set to one, then the SATL shall set bits 7:0 of the REFERENCE TEMPERATURE field to 00h; and b) if bit 7 of the ATA Specified Maximum Operating Temperature statistic is set to zero, then the SATL shall set bits 7:0 of the REFERENCE TEMPERATURE field to the ATA Specified Maximum Operating Temperature statistic.